CHRISTIE

Matrix Series

Powerhouse Simulation Display Solutions

Uses

Flight simulation

Vehicle operation

Ship bridge simulation

Homeland security/ operations training

Air traffic control simulation

Heavy machinery simulation

Architecture, engineering and construction

Today's simulation environments are more demanding than ever before. With extreme specifications including high contrast and brightness and the need to project onto a variety of screen shapes and sizes…each system is unique. The Christie Matrix Series is purpose-built to handle even the most challenging of today's simulation display requirements.

Offering the highest resolution and the highest contrast ratios, the Christie Matrix Series is based on DLP® technology and offers a range of 2500 to 7000 ANSI lumens. Our SuperCR™ technology provides contrast ratios up to 5000:1 allowing for low black levels for incredibly accurate night scene images. Combined with the highest color uniformity and features such as ChristieTWIST™ image warping and edge-blending, RGB color matching, full control of gamma curves and grayscale tracking, high input bandwidth and less than one frame of propagation delay, the Matrix Series is suited to many applications and is also an ideal CRT replacement solution.

Recreate reality with the Christie Matrix Series.

Matrix Series

The Canadian Marine Institute (CMI) is part of the Memorial University of Newfoundland, and is Canada's foremost fisheries and marine training facility. Established in 1964, the complex is used extensively for training a variety of scenarios ranging from applications based around navigating the Atlantic Ocean at various times of the day (both full daylight and night-time scenarios), as well as difficult winter and Arctic environments.

The Christie TotalVIEW™ solution operated by CMI is a Full Mission Bridge Simulator (FMB) comprised of a full 360° field-of-view screen that is 24' tall, with the ship bridge being mounted on a full motion platform. The upgraded display now produces almost 15 million pixels, and is powered by Christie Matrix Series projectors – the world's leading purpose-built DLP® simulation projection technology. The TotalVIEW™ solution also features ChristieTWIST™ – a state-of-the-art edge-blending and image warping technology.

Display Technology

Featuring high-quality DLP® technology and true SXGA+ (1400 x 1050) and full HD (1920 x 1080) resolutions, the Christie Matrix Series is highly reliable and will accept signals from VGA to QXGA (2048 x 1536) resolution. DLP® technology delivers high brightness and unsurpassed color, brightness uniformity and control capabilities. As well, this proven digital technology is low maintenance and completely compatible with 4:3, 5:4 and 16:9 content.

Image Quality

The Matrix S+5K and all Matrix HD projectors are driven by Xenon illumination and deliver superior image quality and the ability to color-match multiple projectors for extremely bright, color rich, uniform images – whether multiple projectors on a single screen, or multiple tiled screen displays. The Matrix 3000 features dual Osram P-VIP® lamps for increased brightness, reliability and cost-effective operation. The Matrix S+2K, Matrix S+5K and ALL Matrix HD models utilize a Color Purity Filter (CPF™) to enable superior color saturation, color matching and superior black levels for unsurpassed day and night scene blending.

Image Processing

With 10-bit image processing, the Christie Matrix Series offers high bandwidth signal processing for excellent reproduction of the source without motion artifacts and smearing. For added ease of blending in tiled applications, Digital Black Level Adjustment lets the user match the blended (gutter) black levels with the non-blended black levels.

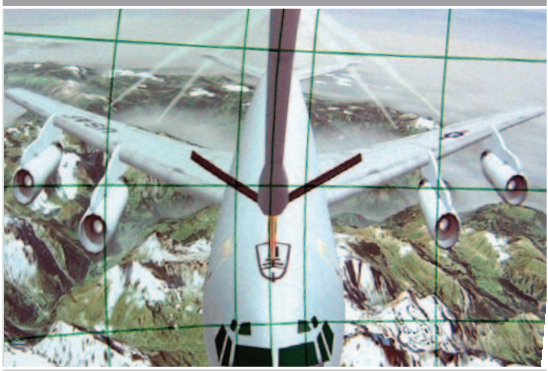
Ease of Use

A user-friendly Graphic User Interface (GUI) makes operation and set-up of the entire Christie Matrix Series uncomplicated. The GUI enables full and easy control of the projector. Multiple control options let the user choose what's best for their application – built-in, IR and wired remote keypad; RS-422 or RS-232 control; or through ChristieNET™ via an Ethernet port. Motorized lens functions provide power focus, zoom, horizontal and vertical offset – all at the touch of a button. Auto set-up recognizes sources and sets up correct brightness, contrast and position.

Serviceability

Operation and maintenance of the Christie Matrix Series is easy as well with lower power consumption, fewer lamp changes and less down-time. Field-alignable DMDs and a cleanable optical engine put full control in the hands of the user. Replacement lamp costs are low and Christie offers the best warranties on the market – 2 years parts and labor (excluding lamp).

AccuFrame™



A Breakthrough In Simulation For 3-Chip DLP® Projectors

As a new firmware feature update for Matrix Matrix S+5K and Matrix HD Series DLP® simulation projectors.

- Developed specifically to address the simulation market, this feature enables the removal of any perceived "double imaging" of content due to image frame perception in the eye.
- Our Matrix line offers an industry first with accurate frame display for NON-CRT projectors that has been able to nullify the artifact to the eye of smearing or double image perception for use in fast simulation environments.
- Can be considered to reduce latency when compared to the current Simulation line (one frame plus as few as 10-20 lines for warping if required).
- AccuFrame™ technology is being added as a free firmware upgrade to all current and future three chip models.
- Fully adjustable to support various frame rates and environments.

The Christie Matrix Series features the widest source compatibility and has built-in Ethernet networking for full compatibility with ChristieNET™ for total projector monitoring and control capabilities.

The Christie Matrix Series features user-replaceable lamp modules with adjustable lamp power for lower brightness. The stable color temperature over the course of the lamp life and the power range provides the best lamp technology for color matching across multiple screens.

The Christie Matrix Series features an extremely high SuperCR™ ratio of up to 5000:1 full field – with the motorized IRIS, users can adjust for high contrast ratio and better black levels, for any given application.

Inputs

The Christie Matrix Series offers installation flexibility and compatibility with any data, video or HDTV source in use today… from VGA to QXGA. The multi-standard video decoder and horizontal and vertical scaling of all inputs gives you the ability to connect to virtually anything.

RGBHV/YPbPr via 5 BNC
DVI-I for digital/analog RGB/YPbPr (HDCP)
One composite video, one S-Video
Matrix HD2, HD7 and Matrix S+5K models have two optional slots for analog/digital modules
Two RS-232 ports, one RS-422 port and one GPIO port
On-board ChristieNET™ connectivity (RJ45)
Built-in backlit keypad and IR remote control

Benefits

- Purpose-built for simulation environments
- Optimized for complex arrays where color matching is very critical
- Matrix S+2K and Matrix S+5K can be used on motion platform simulation systems
- Small, compact designs

Accessories

Standard:

- IR keypad (w/batteries)
- Power cord
- ChristieTWIST™ image warping module with enhanced edge-blending
- User manual

Optional:

- A large variety of fixed and zoom lenses available with throw ratios from 0.67:1 to 7.3:1
- Matrix HD2, HD7 and Matrix S+5K models have two optional slots for analog/digital modules
- Remote control wired extension
- Remote IR sensor
- Ethernet, RS-232, RS-422 cables
- Service manual
- KoRE™ 10-bit librarian
- Lens adapter (for competitive lenses)

An optional suite of specifically-designed lenses includes both fixed and zoom lenses ranging from 0.67:1 to 7.5:1 zoom and features a durable lens mount with motorized horizontal and vertical offset. With quick lens insertion the Christie Matrix Series is easy to work with.

ChristieTWIST™

Application displayed courtesy of Rockwell Collins

ChristieTWIST™

With blending and warping grids that are completely user-definable and offer an extremely fine level of control, displays can take on any shape or dimension required. And the multiple warps and blend properties can be stored on the projector or an external PC.

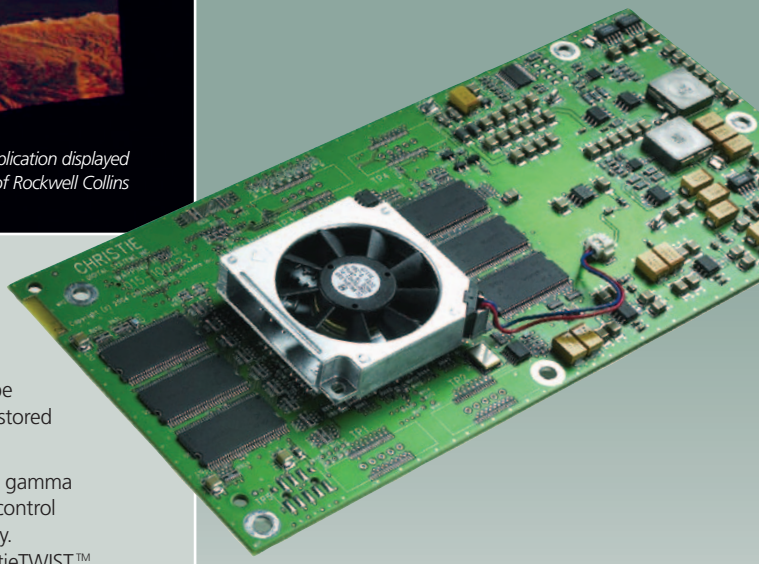


Image Warping and Enhanced Edge-blending with ChristieTWIST™

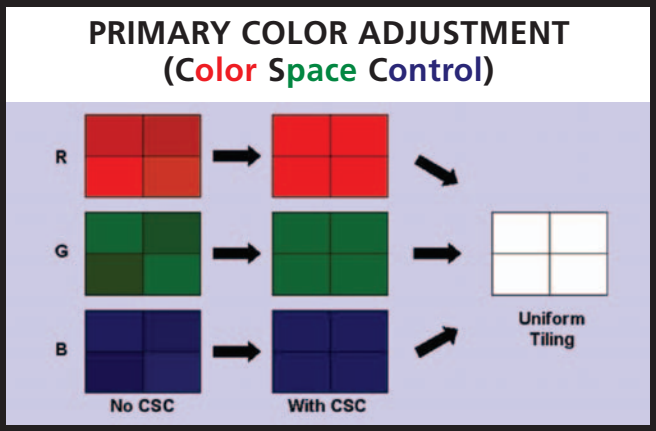
Designed with end-user applications in mind, ChristieTWIST™ provides fingertip control to expertly edge-blend multiple non-linear images on all four sides seamlessly. Images can be warped to fit any dimension or shape. And the multiple blend and warp properties can be stored on the projector – providing easy access and immediate recall of settings.

For high-quality, larger-than-life displays, the Primary Color Adjust (PCA™) and input/output gamma correction produce exact color matching between displays. With an extremely fine level of control of the warping grid, users can map pixel locations precisely for absolute geometric accuracy. Warp to any shape or surface – curved or spherical screens and anything in between. ChristieTWIST™ features a user-defined warp grid and easy-to-use software with latency of less than one frame.

ChristieTWIST™ – the ultimate in total image control.

ChristieTWIST™ Software Features	Basic 1.0	Pro 1.0
Allows warping, blending and masking of projectors (*standard on Matrix Series*)	✔	✔
Allows up to a 10x10' warping grid	✔	✔
Blends are defined with a black and white curve pair for each edge *(top, bottom, left, right)* of the screen	✔	✔
Masks are defined with a mask curve for each edge of the screen	✔	✔
Has a "Blend Calculation" feature that calculates the blend automatically from the current warp	✔	✔
Contains online help and a printed manual. The PDF of the printed manual is installed and is included on the CD	✔	✔
Supports one projector at a time	✔	✔
Supports multiple projectors – can warp/blend/mask multiple projectors simultaneously		✔
Allows an unlimited and arbitrary number of grid lines *(up to and beyond a 10x10 warping grid)*		✔
Display control points and warp lines on projector – a test pattern that is generated in the projector that shows the warp grid and identifies the warp control points		✔
Auto save to projector – periodically save work-in-progress to the projector		✔
Projector control – provides features normally available from projector menus *(select test patterns, shutter projector, select input source, etc.)*		✔

Matrix Series (cont'd)



Christie's Primary Color Adjustment (PCA™) provides the ability to individually adjust actual RGB channels for even color matching within individual projectors, producing true color representation across multi-screen applications for a completely blended image.

Digital Color Management (DCM™)

Only Christie offers a specially designed optical system with a very tight ± 5nm tolerance for primary colors, making multi-channel adjustments between multiple projectors an easy task to accomplish.

Color Temperature Control (CTC™)

Provides the flexibility of color temperature adjustment with a range from 3200K – 9300K.

Comprehensive Color Adjustment (CCA™)

Individually adjust actual RGB channels for even color matching within individual projectors for perfectly-matched images.

LiteLOC™ (Light Output Control)

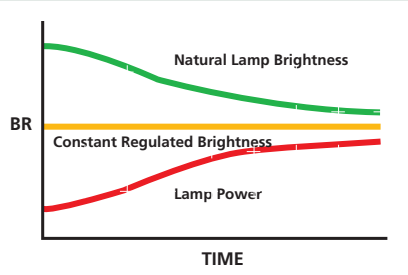
Constant brightness tracking monitors lamp output and automatically adjusts power to ensure continual, uniform brightness.

Minimum Processing Latency (MPL™)

With less than a single frame of the propagation delay between projector input and display, the result is sharp, vibrant images without loss of detail. Minimum delay between input and projection display is critical to simulate real-time interaction between trainee and simulation imagery.

Lamp Power Management (LPM™)

Provides users with the ability to adjust power to the lamps for a consistent and uniform brightness, to monitor and manage the lamp operation in the display.



SuperCR™ Contrast Ratio

With the internal variable contrast aperture, contrast ratios range from 1500-5000:1 for vivid, dynamic image reproduction and low black levels for accurate night-scenery mode.

Spatial Light Image Construction (SLIC™)

Christie-built DLP® engines ensure high-quality convergence and registration between red, green and blue DMDs.

Seamless Image Mapping (SIM™)

Provides multi-channel display with edge-blending on all four sides of the image through proprietary software that can control blend width from 48 to 464 pixels. Easy to use, intuitive on-screen display menus can be remotely controlled via RS-232. Black levels can be further blended through external opto-mechanical blinders.

Color Purity Filter (CPF™)

A standard feature on the Christie Matrix S+2K, S+5K and all Matrix HD the Color Purity Filter (CPF™) enables superior color for both dark scenes in night time simulation and bright scenes in daytime simulation.

Christie Matrix Series Specifications

The first dual-lamp single-chip DLP® simulation projector, the Christie Matrix 3000 delivers bold images, built-in connectivity and fail-safe reliability in a compact, cost-effective package.

Matrix S+2K

BRIGHTNESS
- 2500 ANSI lumens (± 10%)
- 90% brightness uniformity (corrected)
- Color Purity Filter (CPF™)

CONTRAST
- SuperCR™ contrast – 1500-2000:1 full field
- 450:1 ANSI minimum

LAMP
- 500 W CERMAX® Xenon lamp module
- 1500 hours (typical) lifetime
- LiteLOC™ (Light Output Control)

POWER
- 100 – 240 VAC @ 50/60 Hz
- Power consumption: 1000 W maximum
- Thermal dissipation: 3415 BTU/hr
- Operating current: 10A @ 100V/5A @ 200V

DIMENSIONS (EXCLUDING LENS)
- Weight: 72 lb (32.1 kg)
- Shipping weight: 115 lb (52 kg)
- Size (L x W x H): 22.3 x 26 x 12.3" (566 x 660 x 313 mm)

REGULATORY APPROVALS
- UL/CSA/IEC 60950-1
- FCC Class A
- RoHS/WEEE compliant
- CE, eK, CCC, PSE, MIC
- EN55022; EN55024

SPECIALTY FEATURE
- Motion platform ready available build to order*

Matrix 3000

BRIGHTNESS
- 3000 (dual)/1500 (single) ANSI lumens (± 10%)
- 90% brightness uniformity (corrected)

CONTRAST
- SuperCR™ contrast – 1500-5000:1 full field
- 300:1 ANSI minimum

LAMP
- Dual Osram P-VIP® 300 W
- 2000 hours (typical) lifetime
- LiteLOC™ (Light Output Control)

POWER
- 100 – 240 VAC @ 50/60 Hz
- Power consumption: 480 W (dual); 840W (single)
- Thermal dissipation: 3210 BTU/hr
- Operating current: 8.4A @100V (dual); 3.4A @ 200V (dual); 4.8A @ 100V (single); 2A @ 200V (single)

DIMENSIONS (EXCLUDING LENS)
- Weight: 36 lb (16 kg)
- Shipping weight: 45 lb (20.4 kg)
- Size (L x W x H): 14.7 x 20.1 x 10.1" (374 x 510 x 257 mm)

REGULATORY APPROVALS
- UL/CSA/IEC 60950-1
- FCC Class A
- RoHS/WEEE compliant
- CE, eK, CCC, PSE, MIC
- EN55022; EN55024

Matrix S+5K

BRIGHTNESS
- 5000 ANSI lumens @ 220 VAC, 4000 ANSI lumens @ 110 VAC
- 90% brightness uniformity (corrected)
- Color Purity Filter (CPF™)

CONTRAST
- SuperCR™ contrast – 1500-2000:1 full field
- 450:1 ANSI minimum

LAMP
- 1.0 kW CERMAX® Xenon lamp module
- 1500 hours (typical) lifetime
- LiteLOC™ (Light Output Control)

POWER
- 100 – 240 VAC @ 50/60 Hz
- Power consumption: 1600 W maximum
- Thermal dissipation: 5460 BTU/hr
- Operating current: 10.4A @ 100V/8A @ 200V

DIMENSIONS (EXCLUDING LENS)
- Weight: 72 lb (32.1 kg)
- Shipping weight: 115 lb (52 kg)
- Size (L x W x H): 22.3 x 26 x 12.3" (566 x 660 x 313 mm)

REGULATORY APPROVALS
- UL/CSA/IEC 60950-1
- FCC Class A
- RoHS/WEEE compliant
- CE, eK, CCC, PSE, MIC
- EN55022; EN55024

SPECIALTY FEATURE
- Motion platform ready available build to order*

Matrix 4000 available build to order

Matrix HD2

BRIGHTNESS
- 2300 ANSI lumens @ 500 W
- 1960 ANSI lumens @ 350 W
- 90% brightness uniformity (corrected)
- Color Purity Filter (CPF™)

CONTRAST
- 1500 – 2000:1 full field
- 450:1 ANSI minimum

LAMP
- Single 500 W CERMAX® Xenon lamp module
- Up to 4,000 hours starting @ 350 W
- Up to 2,500 hours @ 500 W

POWER
- 100 – 240 VAC @ 50/60 Hz
- Power consumption: 879 W
- Thermal dissipation: 3000 BTU/hr
- Rating: 10A @ 100V, 5A @ 200V

DIMENSIONS (EXCLUDING LENS)
- Weight: 75 lb (34 kg)
- Shipping weight: 120 lb (54.4 kg)
- Size (L x W x H): 22.3 x 26.0 x 12.3" (566 x 660 x 313 mm)

REGULATORY APPROVALS
- UL/CSA/IEC 60950-1
- EMC - emissions: FCC part 15 and EN55022 (CISPR22) Class A
- EMC - immunity: EN55024

SPECIALTY FEATURE
- Motion platform ready available build to order*

Matrix HD4

BRIGHTNESS
- 4000 ANSI lumens (± 10%)
- 90% brightness uniformity (corrected)
- Color Purity Filter (CPF™)

CONTRAST
- SuperCR™ contrast – 1500-2000:1 full field
- 450:1 ANSI minimum

LAMP
- 1.0 kW CERMAX® Xenon lamp module
- 1500 hours (typical) lifetime
- LiteLOC™ (Light Output Control)

POWER
- 100 – 240 VAC @ 50/60 Hz
- Power consumption: 1600 W maximum
- Thermal dissipation: 5460 BTU/hr
- Operating current: 10.4A @100V/8A @200V

DIMENSIONS (EXCLUDING LENS)
- Weight: 75 lb (34 kg)
- Shipping weight: 120 lb (54.4 kg)
- Size (L x W x H): 22.3 x 26.0 x 12.3" (566 x 660 x 313 mm)

REGULATORY APPROVALS
- UL/CSA/IEC 60950-1
- FCC Class A, CCC
- RoHS/WEEE compliant

Matrix HD7

BRIGHTNESS
- 7000 ANSI lumens (± 10%)
- 90% brightness uniformity (corrected)
- Color Purity Filter (CPF™)

CONTRAST
- SuperCR™ contrast – 1500-2000:1 full field
- 450:1 ANSI minimum

LAMP
- 1.2 kW CERMAX® Xenon lamp module
- 1500 hours (typical) lifetime
- LiteLOC™ (Light Output Control)

POWER
- 200 – 240 VAC @ 50/60 Hz
- Power consumption: 2000 W maximum
- Thermal dissipation: 6825 BTU/hr
- Operating current: 10A @ 200V

DIMENSIONS (EXCLUDING LENS)
- Weight: 75 lb (34 kg)
- Shipping weight: 120 lb (54.4 kg)
- Size (L x W x H): 22.3 x 26.0 x 12.3" (566 x 660 x 313 mm)

REGULATORY APPROVALS
- UL/CSA/IEC 60950-1
- FCC Class A, CE, CCC
- RoHS/WEEE compliant

SPECIALTY FEATURE
- Motion platform ready available build to order*

WARRANTY
- 2 years parts and labor (excluding lamp)
- Lamp – prorated

For the most current specification information, please visit *www.christiedigital.com*

Corporate Offices

USA – CYPRESS
PH: 714-236-8610
FX: 714-503-3385
sales-us@christiedigital.com

CANADA – KITCHENER
PH: 519-744-8005
FX: 519-749-3136
sales-canada@christiedigital.com

Worldwide Offices

UNITED KINGDOM
PH: +44 118 977 8000
FX: +44 118 977 8100
sales-europe@christiedigital.com

GERMANY
PH: +49 2161 664540
FX: +49 2161 664546
sales-europe@christiedigital.com

FRANCE
PH: +33 (0) 1 47 48 28 07
FX: +33 (0) 1 47 48 26 06
sales-france@christiedigital.com

HUNGARY / EASTERN EUROPE
PH: +36 (0)1 47 48 100
FX: +36 (0)1 47 48 452
sales-eeurope@christiedigital.com

SOUTH AFRICA
PH: +27 (0) 317 671 347
FX: +27 (0) 317 671 347
sales-africa@christiedigital.com

SINGAPORE
PH: +65 6877 8737
FX: +65 6877 8747
sales-singapore@christiedigital.com

SHANGHAI
PH: +86 21 6278 7708
FX: +86 21 6270 5816
sales-china@christiedigital.com

BEIJING
PH: +86 10 6561 0240
FX: +86 10 6561 0546
sales-china@christiedigital.com

KOREA
PH: +82 2 702 1601
FX: +82 2 702 1602
sales-korea@christiedigital.com

JAPAN
PH: +81 3 3599 7481
FX: +81 3 3599 7482
sales-japan@christiedigital.com

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